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FIFTY YEARS
OF A
BUSINESS MAN'S LIFE
REMINISCENCES



Compliments of
Riehle Bros. Testing Machine Co.
Philadelphia, Pa., U. S. A.



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361

FIFTY YEARS
OF A
BUSINESS MAN'S LIFE



REMINISCENCES

BY
FREDERICK A. RIEHLÉ

Philadelphia, Pa., U. S. A.

1916

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A sheet is inserted at the back of this pamphlet to give the reader a faint idea of the varieties of testing and other machines and products made by the Riehlé Brothers Testing Machine Company

Also illustrations of Riehlé Vertical Screw Power Testing Machines, represented by Plates 614, 673 and 693. These machines, with varied modifications too numerous to mention, and with two, three and four Main Pulling Screws, are manufactured by us. They are arranged for electric or pulley drive, and in sizes from 15,000 pounds to 1,000,000 pounds

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FIFTY YEARS IN BUSINESS

ABOUT fifty years ago, in the summer of 1865, I thought I would like to go into business on my own account. A clerk's position in a dry goods store was not to my fancy, nor did I see much future in that branch of occupation should I embark in it.

My father was willing to let me have capital to go into some enterprise where I might be my own master instead of working for others. It was therefore on my mind to look about for a suitable opportunity.

In the columns of one of the Philadelphia newspapers, I think it was *The Public Ledger*, there was an advertisement which read about as follows: "For Sale—Two-fifths interest in a firm engaged in the manufacture of Scales in Philadelphia."

The thought occurred to me it was a business not overdone and that scales were something absolutely necessary for general daily use, which consideration led me to inquire further into the matter.

An appointment was made with the members of the firm who wanted to sell their two-fifths interest. I found them to be reliable gentlemen and willing to explain why they wanted to dispose of their holdings.

After investigation and careful inquiry, I realized that the company was a going concern, in good standing with the community; being composed of reputable and intelligent gentlemen, who were carrying on the business in a small way.

The members of the firm who advertised that they wanted to sell out desired to invest in an iron foundry, which business they preferred to that of making scales (for what reasons I did not inquire), and they needed more money to pay for the investment in the iron foundry. The books were examined with the greatest of care and the information obtained as to the cost of the articles that they were manufacturing, and I found that there was quite a good profit in the construction and sale of scales.

As a matter of fact, scales, like many other articles, require considerable outlay and expense in selling. The smaller scales were sold to dealers at a liberal discount and the larger ones were mostly retailed from the factory. It was necessary to have skilled mechanics to go through the country, to place the scales in position, wherever sold.

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Railroad and hay and coal scales require excavation, masonry work, and a great deal of lumber; some of the very largest scales taking weeks to build and arrange in working order. The cost of mechanics, freight, traveling expenses and board sometimes run into quite high figures.

All of the above requirements were taken into consideration, and after due reflection I purchased the two-fifths interest and embarked in the enterprise, continuing the firm name of Banks, Dinmore & Co., under which style the company was conducting their business. This was on October 1, 1865.

The writer took charge of the books and it was not a very long time before he was convinced that while the business was a good one, the firm in good standing, and their scales favorably known, they did not have sufficient capital to carry on the project successfully.

Then began the universal experience of every manufacturer, viz., that of borrowing money. This became necessary from time to time, until the debt grew to quite a considerable amount.

The location of the factory was at the northwest corner of Fifteenth street and Pennsylvania avenue, which building is still standing and was until recently occupied by Messrs. Harrington.

The scales were manufactured in an old-fashioned way, by skilled workmen and a few apprentices. The "scale men," as they were called, were old hands, they knew their business, and carried their knowledge with them; no drawings were kept and there were no accurate accounts taken of the income and output, nor of the cost of the scales; in fact, it was run in about as primitive a way as an old-fashioned country store.

This was the condition of affairs that I found. I soon began to introduce a better and accurate method of arriving at the cost and expenses, which efforts were soon rewarded by realizing more satisfactory returns.

My first startling experience was when, one fine day, four or five of the most skillful men walked into the office dressed in their Sunday clothes and said, "We have formed a company and expect to go into the scale business for ourselves." These men were really the backbone of the manufacturing department of our company and they left us and established a factory right across Fifteenth street, in sight of our works, and there they commenced to manufacture scales with but limited output.

These men canvassed the neighborhood, the city and surrounding country very thoroughly, with the energy that only persons who are working for themselves can employ, and this, of course, resulted in their securing some business and in our losing occasional orders.

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In this way we soon learned that we were losing some of our best customers and that local competition would follow and lower prices prevail.

The next thrilling incident that came to our attention was that the Abbott Scale Works at Ninth and Melon streets, Philadelphia, was being offered for sale by the trustees. This had been a successful concern, established many years ago, but at this time it was mismanaged and in consequence was gradually dying a slow but natural death. Our firm was apprehensive that some of our largest and most active competitors or some large manufacturing corporation would buy out the business and franchise of Abbott & Company and re-organize the business and branch out extensively and gradually introduce fierce competition, which would very likely endanger the life of our firm.

As the result of due deliberation on our part we approached the trustees of the firm of Abbott & Company and, after arranging many difficult details, concluded to buy this company out, so as to forestall the probability of any larger concern becoming our competitors. By doing this, we could not only get rid of a competitor, but add their list of customers, which was quite lengthy, to our list, therefore appreciably increasing the prospect of our doing a larger business.

We arranged to move our factory from Fifteenth street and Pennsylvania avenue, which we only occupied as tenants, to the buildings owned and occupied by the Abbott Scale Company. We found, upon examination, that the buildings of Abbott & Company were in a quite dilapidated condition, and before we could occupy the works we found it necessary to make quite extensive alterations, which required several thousand dollars, but which outlay would secure for us greater facilities in the handling of material and reduce the cost of the finished products.

In addition to one of the advantages we obtained by purchasing Abbott & Company, the plant included an iron foundry. We had been buying our iron castings from different foundries and found that our patterns were often in peril of being destroyed by fire or damaged by careless handling, and that they required constant repairing and renewing. The patterns which we owned and required in our business were very numerous and valuable. We subsequently realized that the iron foundry was a great advantage to us, and exceeded our expectations in the necessary economy of successful manufacturing.

In a careful examination of our books from time to time we learned that our expenditures were out of proportion to our income, and that a re-organization was not only desirable but imperative. I drew the matter to the attention of my father and

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brother, and as the latter was desirous of engaging in business, thought this might be a favorable opportunity for him in case we succeeded in making satisfactory arrangements with the other partners.

We concluded to offer to buy out their three-fifths interest or have them buy my two-fifths share, as to continue the business under the present conditions would prove unsatisfactory to all concerned.

The other partners cast around and inquired among their friends and relations, to see if they could raise the sufficient capital to purchase my two-fifths interest. They failed in their efforts and after a reasonable time allowed them to complete their investigations, they said that they were not able to secure the necessary amount of money and they were willing to sell out their interests to me.

Having secured the requisite sum of money to purchase their interests, I handed each one a check for the amounts agreed upon and they walked out of the office, leaving my brother and myself in sole charge and ownership of the works. My brother had been acting as bookkeeper for a short time previous. This was in the year 1867.

My brother and I looked at each other and said, "Well, what shall we do now? Shall we continue the name of Banks, Dinmore & Company, which had somewhat of a reputation, or start again with another name? And, if we make a change, what shall it be?" One of us said, "Why not call it Riehlé Brothers?" And this was the name we started afresh with.

We continued the business and pursued it with due energy, advertised freely and succeeded in gaining a fair reputation for manufacturing scales and testing machines. As a result of continuous and unceasing energy and effort, the firm of Riehlé Brothers and their products became known not only in the city of Philadelphia, and throughout the State of Pennsylvania and the United States, but the whole world.

After a few years (in 1875) we found the buildings we were occupying at the northwest corner of Ninth and Melon streets, which then belonged to the Philadelphia & Reading Railroad Company, were not substantial enough to hold the stock of goods we carried with safety. It was four stories in height, on Ninth street, and when one walked through the third and fourth floors, they seemed very weak and a slight vibration was noticeable, so we were afraid that at some time the building might collapse. At that time some brace rods were put through, from wall to wall, but notwithstanding this, we concluded that it was about time to look around for a larger, more modern and substantial factory.

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In "Centennial year," the summer of 1876, we looked all around through Philadelphia for a suitable building or lot of ground where we could locate. We finally purchased an iron foundry which was erected on a large lot of ground on the west side of Ninth street, just above Master street, on the line of the Philadelphia & Reading Railroad.

We erected on this lot a large machine shop and other buildings and moved all our stock, tools, patterns, drawings and the contents of the whole establishment from Ninth and Melon streets and occupied this new plant, where we have remained up to the present time.

This property had a railroad siding which we found very useful, as we could run the cars directly into our yard, which convenience added greater facilities in the handling of our materials and products, both in receiving and shipping.

Since we first built and improved the plant originally we have added some new buildings, until we have covered over the whole lot of ground which had remained unimproved when we bought the property. The Works were unnecessarily large when we moved into them in 1876, but now they are uncomfortably small, although we still remain there.

Among some of our experiences we would mention: When we bought the property in 1876 there was a roadway in front on Ninth street, and we planned the office building and main entrance to be on that street. When we were all comfortably settled down we found the engineers of the Philadelphia & Reading Railroad Company coming along Ninth street and putting down an extra railroad track right in front of our office. This placed us at a great disadvantage and necessitated our re-arranging the works and make the main entrance on the rear, which is Hutchinson street.

This was many years ago, a little while after the Centennial, and the additional trackage was considered necessary by the Reading Railroad for the requirements of its increasing business.

A year or two ago we heard the unfavorable news that the Philadelphia & Reading Railroad Company were planning to build an elevated railroad on Ninth street. Upon examining our deed we found that instead of owning, as we thought, enough ground to have a roadway on Ninth street, we only owned about four and one-half feet away from the front building line. The Railroad Company used all their privileges of roadway and built to within a few feet of the front of our office. This has proved annoying in many ways, and in addition to the noise and dirt we are obliged to use electric lights instead of having abundant sunshine, as formerly, and our office is dark and gloomy.

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The writer has had occasion to visit a great many of the offices in many of our very expensive and extensive new office buildings, and notices, to his surprise, that most all of them not only have, but positively need electric lighting; this fact has reconciled him very largely to the use of electric lights in our offices.

While the present works are not as large or convenient as could be desired, it is most likely that no change in location will be considered favorably in the early future.

In the year 1876 the factory was thought to be too far away from the business centre of the city to attract customers and this fact led us to consider the desirability of opening a store on Fourth street above Chestnut.

Subsequently, we moved to 413 Market street and later to 19 North Sixth street. In 1890 the store was closed and the stock and fixtures moved to the present address, 1424 North Ninth street.

In the year 1903 the firm of Riehlé Brothers (of whom the writer was the surviving partner) was incorporated under the laws of the State of Pennsylvania and the name changed to Riehlé Bros. Testing Machine Co.

AS TO THE SCALE BUSINESS

IN purchasing an interest in the firm of Banks, Dinmore & Co. I became possessed of proportionate shares in several valuable patents, viz., Davis Patented Coal, Hand, Cattle Scales; Davis Patented Furnace Charging Scales; Davis Patented Parallel Crane Beams; Davis Patented Double Beams, and others.

These were formerly the patents of Mr. A. B. Davis, who was a very ingenious and successful inventor.

I found there was a very extensive use for scales and the above-named firms had a long list of customers on the books, therefore the good-will of the above firms was quite a valuable asset, and it was much easier to continue the business than to start an entirely new one.

As the result of the absorption of these two companies, with the prestige and franchises, we became quite important factors in the scale business and carried it on with more energy and efficiency than it had been done previously; in fact, we made quite an impression upon the community by our enterprise, which was quite unusual at that time.

Business activity was more conspicuous fifty years ago than now, as exemplified by the energy with which present manufacturing and other industries are carried on.

A short time after we bought Abbott & Company out, our firm name was changed to Riehlé Bros., to which fact we made reference before.

We advertised more extensively and sent out competent traveling men. We established agencies in New York City and Pittsburgh and our salesmen caused the Riehlé Bros. Scales and Testing Machines to be well known far and wide.

HISTORY OF THE SCALE BUSINESS

About fifty years ago the scale business was comparatively in its infancy, as it was but a few years before that the first platform scale was designed, constructed and used.

Previous to this time the equal beam scales and steelyards were the only means of weighing any articles.

The equal beam requires an equal amount of weight put on one end so as to counterbalance the material being weighed.

Thus, if one wants to weigh, say, a bag of coffee weighing two hundred pounds, the coffee would be suspended at one end

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of the beam and the weigher would have to place enough iron weights on the other end to amount to two hundred pounds. While this is a correct way of weighing, it is obsolete and tedious.

Another method of weighing is by means of the steelyards. These are still used, but not as much as formerly. They are exclusively used in the far East, such as Turkey, India, etc. Pictures showing people weighing goods in many foreign countries, illustrate the method of weighing, by means of these steelyards. They have the advantage of being portable, very compact, and are accurate. The steelyard consists of a beam with the pivots and bearing surfaces at an unequal distance one with the other. A bale of hides, or some similar bundle, can be hung on one of the suspended hooks and a small weight, which is called a poise, is passed along the top of the other part of the beam (which is notched) and passed out far enough to counterbalance the weight of the bundle to be weighed. On this style of beam a small poise, say of sixteen pounds weight, when moved out to the end of the beam, will counterbalance a weight of one hundred pounds or so, whereas in an equal beam, as noted above, the weight on one end must be precisely the same as on the other to counterbalance the weight of the bundle or bale. Both of the above style scales are very crude and unhandy, but being portable and answering the purpose, they are still used quite a good deal. Some old-fashioned people will use nothing else.

A Mr. Thomas Ellicott of Philadelphia, who was a manufacturer of weighing beams, designed and constructed the first platform scales. This was done by using the weighing beam and intermediate levers connected with the framework supporting the platform on which the article to be weighed is placed.

These were used first in the old Lehigh Navigation Company's warehouses on Dock street, in Philadelphia.

The platform scales, which were made portable or placed flush with the floor (so that a barrel or truck could be rolled on it and over it), was designed and constructed in Philadelphia and antedates the Fairbanks or other makes of patented scales.

The platform scales were improved from time to time in very many ways, both as to size and capacity, so that larger articles than mere barrels, etc., and heavier and bulkier articles, or a number of barrels or boxes could be weighed.

Again, after a time, the platforms of scales were made on the same general principles, but with further improvements and large enough for weighing and accommodating a number of cattle at one time.

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These are used up to the present date in the coal yards and hay warehouses, to weigh coal and hay.

The coal or hay wagons (or now automobiles) are passed over the scales and weighed; then the weight of the wagons is deducted from the gross weight, and the net weight of the contents of the wagon recorded.

The same style of scales were then made longer and stronger, so as to weigh railroad cars.

Railroad track scales were first made about twelve feet long, to weigh one car at a time, say about five tons capacity, this being the first old-fashioned car built and used by the railroad companies.

After a while the railroad track scales were lengthened and strengthened still further, so as to weigh, say, twenty tons, and forty tons, and eighty tons, and one hundred, and then one hundred and twenty-five tons. The latter were made over one hundred feet long and could accommodate several large cars.

The increased use and additional improvements noted in the construction of scales were all contemporaneous with our firm, and, of course, other firms in the scale business throughout the country. I would recall here the fact that the first coal cars were built to hold five tons (ten thousand pounds). Afterwards the coal cars were made to carry ten tons, then twenty tons, and now the regular steel frame coal cars are made to carry fifty tons. (I think this is the minimum.)

The weigh masters at the present time weigh the coal cars in motion while they are passing over the scales. The cars are uncoupled and pass along by gravity and each car weighed separately. The men become very expert at this business and a long train of cars can be weighed in the shortest possible time. After the cars pass off the scale, the cars are again coupled and the train proceeds to its destination with but little delay.

The varieties of scales continue to increase to a marked extent and are used to great advantage in various styles and designs.

Many years ago grain, for instance, was weighed in bags, loaded on wagons and hauled from the point where it was received, to the place of destination. Now, large scales of thirty or forty tons capacity of special design are installed in elevators for the purpose of weighing grain expeditiously and without handling.

The scales in elevators are built in on the upper floors, say about one hundred feet from the ground, and the grain to be weighed is carried up by elevators and passed through the scales and weighed and stored in large bins below, but still high enough

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to be chuted from these bins into the hold of the vessels for shipment. All of this operation is performed without anyone touching or handling the grain.

Some of the largest elevators are arranged with thirty or forty bins, each equipped with a large scale. A grain elevator at first used to cost \$100,000 or so, and was very limited in size and usefulness. Now a large elevator costs over a million dollars to build and equip in an up-to-date manner.

One of the most important varieties of scales that we controlled were what were called the Davis Patented Furnace Charging Scales. These consisted of a weighing platform and of a number of weighing beams, varying from three to six or seven. These beams were secured in a wooden frame box, called a "beam box," with only indicating pointers projecting through the front of the beam box.

Each beam was arranged to weigh a certain weight, and the men, who carried the materials on wheelbarrows, passed the wheelbarrow on to the scales, and then put more ore on or took some off, so that the indicator projecting through the front of the beam box would move up or down. By watching this indicator the man could see whether the quantity of material on the wheelbarrow was correct or not; he would then pass on and discharge the contents of the wheelbarrow into the top of the blast furnace stack. This process was continued, and with different materials, such as coal, limestone, and several varieties of ore, as directed by the Superintendent.

This is one of the most important inventions of Mr. Davis, and, in fact, our owning this patent and controlling it was exceedingly valuable to our firm and had a great deal to do with our success.

It was thoroughly appreciated by all blast furnace owners and managers and at one time whenever and wherever a new blast furnace was built throughout the United States, a Riehle Furnace Charging Scale (this is what we called it, although it was patented by Mr. Davis) was considered indispensable, and orders came to us for one or more of these useful scales.

The patented hay, coal and cattle scales which we controlled was also a very popular one. We considered them to be more ingeniously designed than the other makes of scales and they soon found their way among our customers in almost every State in the Union.

Then, again, we built what is known as a Canal Weigh-lock Scale. Doubtless few persons are aware that scales have been made large enough to hold and weigh a canal boat full of coal, and accurate enough to record the weight of a man should he

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step on to the boat while it is being weighed. There were several of these scales in use in Pennsylvania and New York, some of which were made by our firm and some by Abbott & Company. These scales cost several thousand dollars to make and build into the locks of the canals, and it was considered quite a large contract to receive an order for one of these large scales. The canal boats were floated into the locks and when the water was run off, leaving the lock empty of water, the canal boat rested on heavy timbers supporting a large platform, and the whole structure was suspended from a series of large levers arranged all around the edge of the upper part of the lock, which levers in turn were connected by intermediary levers and thence to the weighing beam. This weighing beam was in the office of the weigh master of the canal, whose duty it was to weigh and record the weight of these canal boat loads of coal. As noted before, the scales were very large and were quite sensitive. Most of the canals have been discarded and their usefulness at an end, being replaced or displaced by railroads.

When we first went into business most of the scales were constructed with wrought iron levers. This required heavy forgings and expensive blacksmith work, but after awhile cast iron levers were used in the place of wrought iron ones, requiring new designs but less expensive outlay in construction. At a still later date some of the smaller wrought iron parts of scales were replaced by malleable iron. Malleable iron castings were first introduced about fifty-five years ago, and almost revolutionized the designing and construction of many machines, among others scales and testing machines. The malleable iron castings were thoroughly tested and experimented with and their use was found to be satisfactory for manufacturing requirements, and this metal was substituted largely for cast and wrought iron parts.

Our firm manufactured portable platform scales in large quantities and disposed of them through hardware stores, also our own agencies. We never manufactured small counter scales or scales smaller than portable platform scales of from four hundred pounds capacity and upwards. These small platform scales were generally made to run on wheels, so that they would be easily moved around the buildings, on the floors. We also manufactured railroad, depot and warehouse hand trucks. This branch was carried on to a limited extent for our customers and we only manufactured a few.

We also made marble moulding machines, Robie patented screw jacks, hydraulic pumps, both hand and power, and a variety of other appliances. We also designed and constructed special machinery for engineers, contractors and others we came across

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who might desire this kind of work. This kind of special work always kept a small force busy and the results were mostly satisfactory to us, although sometimes quite the reverse.

Riehlé Bros. pursued their business with such an enthusiasm and success that they realized that they were the targets of other and larger companies, such as Fairbanks and Howe scale firms, and competition became very great and still greater, and to such an extent that it might be called "fierce."

During the year 1890, my brother, Henry B. Riehlé, died, and the writer continued the business by himself under the same firm name and injected a still greater measure of vigor and enterprise into it.

I learned that our success was such that we were interfering to such an extent with the other companies in our business that it was necessary that we were in some way gotten rid of.

Without solicitation we were approached by different parties as to whether we ever thought of giving up or going out of business. This did not appeal to us and we used greater efforts to make ourselves still better known, naturally resulting in the increased output of our works, and about twenty-five years ago we were asked to name a sum at which we would sell out our scale business and go out of that branch of industry.

After several interviews with agents who were sent to us by some parties (we never knew from whom, although we have our suspicions), we came to an agreement and concluded arrangements with them to sell out our scale business. This was accomplished during the year 1891.

The agreement that was made with the persons to whom we sold out was, that we were to deliver to them, at our works, all the patterns, stock of scales made up and in process, and all the tools required exclusively for making scales, also surrender the patents that we owned. We did this, and after all the above articles and materials were shipped away from our factory the place looked as though it had been rifled or visited by burglars. All the materials we turned over to our friends were stored at warehouses near Twenty-fourth and Chestnut streets, where they remained for several years, I think about ten. Then they sent several men to these warehouses, who were instructed to destroy all the scales and scale materials, even though they were in shape to be used, but they were so anxious to effectively wipe out the name of Riehlé in so far as they were connected with the scale business, that they destroyed all the patterns and broke up all the parts and material that were stored. Thus ended the Riehlé scale business. However, even at this later day one comes across some of these scales that are still in use and doing good work.

AS TO THE TESTING MACHINE BUSINESS

THE first time a machine for testing the strength of materials was designed in Philadelphia was when I was connected with the firm of Banks, Dinmore & Co., in 1866 or 1867. I do not mean that experimenters have never made some crude affairs for gaining some information about the strength of materials, but I mean as to making machines, as a separate branch of business and upon a business basis. In fact, Mr. Trautwine made an infinite number of tests upon some just such home-made rigging, and doubtless other progressive seekers after facts did the same. Mr. Fulton, of the firm of S. Fulton Company, came to our works, which were situated at the northwest corner of Fifteenth street and Pennsylvania avenue, and asked us to design and construct a machine for making a tensile strain of cast iron. Mr. Fulton was a manufacturer of cast iron pipe for gas and water in Conshohocken, Pa. He explained that he was making some water pipes for a contractor for the City of Boston.

Some of the pipes he had made had broken, either in transit or in handling, I do not recall which, or it may have been after they had been in use for a short time, and it was claimed that the iron that was used in the manufacture of the pipes was of inferior quality, and the pipes not strong enough to stand the strain that was required of them.

A very large sum of money was being withheld from the contractor and in order to get it he and S. Fulton Company were obliged to sue the City of Boston. Mr. Fulton brought some pieces of pig iron to the works and asked us to prepare specimens from them, and when the machine was finished to break them and give him a certificate testifying as to the strength and quality of the iron.

Mr. Banks was the mechanical man of the company and designed our first testing machine. It was one of twenty thousand pounds capacity.

The machine consisted of uprights and cross-pieces of timber. On one of the upper cross-pieces was placed a "Justice" hydraulic jack. This was the name of the manufacturer of the jack (he was the promoter of the William Butcher Steel Works at Nicetown, Pa., and who was succeeded by the Midvale Steel Works). From this hydraulic jack was suspended a Riehle patented crane beam from a stirrup and from this beam was arranged

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proper tools for holding the upper end of the specimen. On one of the lower cross-pieces were arranged, in position, proper tools and jaws for the lower end of the specimen. At a convenient place on the machine was placed a "Justice" hand pump, operating the jack. The beam being perfectly balanced, the specimen was secured above and below, and the hand pump, being operated, raised the jack and beam, which caused a strain upon the specimen. As the strain increased, the weigher moved the poise out on the beam and also put heavy weights on the end of the beam to restore the equilibrium. This process was continued until the iron specimen broke. The amount of strain which caused this specimen to break was learned, by the operator counting the weights and observing the position of the poise on the beam. This strain was noted and a certificate given for the several specimens that were broken, to Mr. Fulton. To insure a correct test, the equilibrium of the weighing beam of a testing machine must be maintained during the continuance of the strain.

This was the first test made in our works, and on a specially designed testing machine, and, in fact, was the commencement of the manufacture of the Riehle testing machines, which has been kept up continuously by the writer for over fifty years.

Naturally, the first testing machine was a very crude affair, but it was accurate and answered the purpose for which it was intended.

It might be interesting to the reader to note that the test of the specimen proved the iron to be of good quality, and as I recall, it settled the lawsuit in favor of the contractors and S. Fulton Company, which amounted to many thousands of dollars.

Almost immediately after this successful experience, the favorable results became known, and the consequence was that similar machines were made and sold by our firm to nearly every pipe works in the United States, if not to all. The next style of testing machine was made for a party who required a testing machine of the same general character, but of seventy-five thousand pounds capacity.

The same general design of machine was used, but an intermediate lever introduced which increased the capacity about five times. The same style and size "Justice" jack was placed on top, but a larger size hand pump below and underneath the testing tools. This machine was designed for a person desiring to make tensile tests of boiler plate. Several styles of testing machines of various capacities and modifications were designed, made and sold to a great many boiler plate manufacturers throughout the United States. The design of the pump and jack was changed and these we made at our own works, instead of buying them.

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About 1870 the Supervising Inspector of Steam Engineering of the U. S. Government at Washington inquired of us as to the cost of boiler plate testing machines for the United States Government.

It was required that the machines be made all of metal, instead of wooden frames, as heretofore.

The design was modified by our Superintendent and the contract for the first testing machines made by us that were constructed entirely of metal was awarded us. This first order was for ten machines, seven hundred dollars apiece, and the contract amounted to seven thousand dollars.

We received inquiries daily for testing machines from many of the iron and steel works, the United States Government, and from colleges, for all kinds, varieties and styles of testing machines, varying from 100,000 pounds capacity, and again those of 150,000, 200,000, 300,000, 400,000, 600,000, 800,000 and 1,000,000 pounds. At this time many of these machines inquired for and sold were usually for tensile strain only; some inquiries came from similar machines for testing lighter specimens of material, say for 20,000 pounds, 10,000, 5,000, 1,000, 500, 100, 50 and 25 pounds.

Then, again, inquiries came for machines for making different kinds of tests, which necessitated modifications in the forms of specimen holders. Inquiries would come for machines to test by transverse strain, also by compression strains, also for torsional strains and indenting tests.

Some customers wanted machines for testing tensile specimens in long lengths. The first cast iron specimens were made in the form of a spool, something like a common wooden spool, with a breaking area of one inch and very short length. The United States Government adopted the form of tensile specimens of boiler plate, the breaking section reduced to one inch in width—the arc of a half-circle and of no length, for elongation or for exposing weak points, if any existed, in the reduced section. The practice abroad was to have a reduced section eight inches long. Our company persistently and continually urged the Government of the United States to use the same form of specimen as had been adopted abroad, and finally they did adopt this form of specimen. Inquiries were received from rolling mill companies who made wrought iron, for testing machines for long specimens. Some specimens were made of different materials varying from two, three, four, five and six feet long, sometimes longer, so the machines were designed with higher columns to take in these longer specimens.

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Then, again, parties inquired for machines to take short and long specimens for transverse strain. These specimens varied in lengths of twelve inches and for larger transverse specimens even up to three, four and five feet and longer. The size and requirements of testing machines increased in diversity, step by step, up to the present time, when the variety of requirements grew one hundred fold and is still growing.

New requirements, new designs are being worked out constantly.

The greatest improvements in the Riehlé testing machines have been made in the last ten or fifteen years.

For testing such articles as manilla or wire rope, chain, and long bridge members, testing machines are constructed for straining the specimens in a horizontal position. These machines are of the heaviest capacity, ranging from 20,000 pounds up to 1,000,000 pounds. Horizontal testing machines are made also of smaller sizes, to test very light specimens, such as wire, or small pieces of chain and for specimens, say two or so feet long, and up to twenty, thirty or fifty feet long. The capacity of the horizontal testing machines, therefore, range from ten pounds up to a million pounds.

Testing machines for applying torsional tests of materials are also of the horizontal type, and in capacities varying from fifty pounds and less up to nearly two million pounds capacity. The length of these specimens vary, say, from three inches up to seven or eight feet, as the customers desire. The smaller machines twist small specimens, or wire, etc., while larger ones strain specimens of iron, steel or other metals or materials in sizes varying from one inch square or round up to four or five inches square or round.

In addition to the great variety of testing machines, I would mention that there is also a great variety of necessary appliances to secure the several forms of specimens in the machines. In fact, the variety of tools is greater than the different forms of machines.

There are also many appliances for measuring and determining the action of the specimens during the process of testing. The Riehlé extensometer will measure the tensile and compression strains on a specimen to one ten-thousandth of an inch. Of course, these fine tests, and, in fact, all tests, can only be made with satisfactory results by experts.

The testing machines after their completion and before delivery undergo a most rigid inspection as to workmanship and delicacy of operation, involving accuracy and reliability. They are also calibrated and proved up to their full capacity.

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In constructing very large testing machines for physical laboratories, we are frequently asked by the architects how much space our machines will occupy—the depth of the foundations and height of the upright columns. The architect would say that “before progressing with the building or even locating it, you will please inform us of certain measurements that we would require.” In a word, it is actually necessary to design a building to hold the machine or machines and to make the building accommodate it.

The Riehlé testing machine was selected by the United States Government for the purpose of making tests of all the materials that were used in the construction of the Panama Canal. Our machine was selected without any effort on our part, and, in fact, without our knowledge—the name “Riehlé” being sufficient guarantee of the quality of the work that could be done on these machines. This prestige Riehlé have enjoyed for over fifty years. This is only one of nearly a hundred Riehlé testing machines in use by the United States Government at the Government Navy Yards, Arsenals and other stations.

AS TO TESTING

IT is simply impossible to give the reader of this paper the faintest idea of the variety of tests that are called for or the many sizes and styles of Riehle testing machines. Some of the machines are for testing by abrasion; for testing oils; for testing springs used for locomotives, cars, automobiles, etc.

Engineers and experimenters require an infinite variety of tests. Among them would mention the following: Tension, transverse, compression, torsional, shearing, indenting, etc.; and for tubes or similar articles, bending and bursting, also twisting tests, are required.

Tests are made for experimenting as to the length of time required to cause the materials of which the specimens are made to change their character. Thus, in some cases, an eye bar or structural member will be placed in the machine and a certain strain applied and the investigator would examine the specimen from time to time to detect any variations in its condition that may occur. Sometimes these specimens are strained for days, weeks or months.

Among the tests for compression may be one to find out what strain an iron column or a marble or stone column will stand. On some occasions the expert will have a column of brickwork constructed, say twelve inches square (or it may be larger or smaller), and the height may range from eight or ten inches up to ten, fifteen or even twenty feet. Such tests are made to learn the comparative strength of columns of same dimensions, whether made of brick, stone, iron or steel. One can readily realize how many varieties of tests it is possible to make. In fact, they are unlimited.

By ingenious designs and schemes, the testing expert can gain information not otherwise possible. From the tests can be learned the comparative values of the properties of stone or, in fact, any metals or alloys or other materials, either in their natural state or other varied conditions. For instance, as to tests for oils, they will try several varieties of oil, and observe how many revolutions of the abrasion surfaces in the machine the specimens stand without heating, using a thermometer to test the temperature and a counter to note the number of revolutions. There is also a variation in the tests, by applying different degrees of pressure of the abrasion surfaces. Some oils will heat and

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show their inferiority very early in the test; other oils will be affected very differently and show no appreciable change in the temperature under many hundred revolutions of the counter. Of course, the oil that shows the most endurance is the best oil.

The abrasion test is often used for trying different alloys of metal, bricks, cement and any similar substance that can be placed between the abrasion surfaces. The results are noted the same as in the oil tests referred to above.

The tests of springs have no limit as to variety. Some machines are used for compressing a spring to see how much weight it will carry without causing a permanent set. Also what weight it can carry safely and comfortably for a reasonable period, and also what weight will crush and destroy the spring. As frequently noted in this paper, the forms and kinds of tests are almost as numberless as the stars. There is no limit to the amount and value of information experts can acquire or desire.

Much has been left unsaid and unreferred to upon the subject of physical testing, just as one would fail in attempting to number the sands on the shores of the seas.

It may interest someone to know of the variety and number of tests made upon different structures. For instance, in building the foundations for the Statue of Liberty in New York Harbor, there were 30,000 tensile tests made of the cement used. After these specimens were broken and the quality noted, they were arranged on the floor of the laboratory in the form of a column—several feet in diameter and about ten feet high.

This is only one of a thousand instances where tests of cement have been made on the Riehlé machines. The cement testing machines are portable and one or more can always be found at the engineers' or contractors' offices wherever they are doing large work.

I would also inform the reader that in making bridges of cement, which is now largely the practice, engineers are sent (in many cases) to the bridges and the temperature of certain parts of the bridge observed. This is done weekly and a record kept of the result for years.

No one not conversant with requirements and practices of engineers can imagine, even with the greatest effort, the number and variety of experiments made by the experts, all in the nature of physical tests and physical examinations. All these numerous tests that I am referring to are exclusive of the chemical tests of all materials manufactured, used and sold. It is a busy part of the expert's activity, which, although usually not noticeable to the casual observer, is inexpressibly important.

Many years ago houses were built of wood, also vessels,

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bridges, etc. The wear and deterioration of wood, by close observation, is plainly noticeable, and when any weakness is discernible, the trouble can be remedied before any serious accident is likely to occur.

Since the writer has been in the business of manufacturing testing machines, etc., many changes in conditions have taken place. For instance, buildings are now constructed of iron, cement and stone, and of great height and depth. They are frequently three or four floors below grade and twenty, thirty and forty stories high. Vessels are now being constructed of iron and steel instead of wood, and the iron and steel must be carefully tested, requiring the invaluable use of these testing machines. Bridges are now built of iron and steel, and the quality of all these materials must be proved on testing machines.

Tests of specimens are very important, but it is best, when it is feasible, to test structural members in full size, viz., the size that they are to be used in. It is prudent to test such a member and record the deflection, but it is still better to test such members to destruction. Then one will know exactly what strain it will require to break it.

No one can possibly imagine the variety of tests that people ask for.

Notwithstanding our selling and making testing machines near at hand and all over the world, we have installed at our works, Philadelphia, a well-equipped Physical Testing Laboratory, where people are bringing and sending all kinds of things and materials to be tested. The reader might imagine that, as we make testing machines for other people, and they are so extensively used, we would have little or no testing to do for the public at our Laboratory, but the desire for testing everything that it is possible to make or handle seems to spread and increase from year to year. Some people want small specimens of cloth, wire, chain, and metals to be tested, and others send large structural pieces and members used in the construction of cars, bridges, track and all sorts of things.

It is needless for us to assure the reader that all the tests that have been made by the Riehlé Physical Laboratory have been made with the greatest care, on accurate testing machines, by skilled experts, and the results positively accurate, so far as humanly possible. The reports are kept confidential, and recorded in volumes which are kept under lock and key. The responsibility of our firm, the correctness of our tests, and the confidential relations that we maintain with our clients, have resulted in constantly increased volume of work beyond our early dreams.

REMARKS

THE following remarks are made entirely from memory, without consulting the books or any memoranda. This will account for a discrepancy in the dates, should anyone question the exact time, but any inadvertency is not from any malicious intention, but only from neglect, carelessness or forgetfulness. There is no intention to mislead or make comments that may be considered unfavorable.

As I noted in the previous chapter about testing machines, the first machine was made for a definite purpose and for an immediate and pressing order, and it was a great success for the manufacturer and the user. Our firm was the first concern in the United States, and, as far as I know, in the whole world, to begin to make a business of building testing machines. Many machines had been designed by the Government, and no doubt some crude machines were in existence years ago, designed and constructed by Professors of Mechanical Engineering at colleges, or by some mechanics at factories, for making some special tests. Anybody can make a testing machine; it consists of merely a lever or levers, beams and weights, and the specimen holders, and some form of motive power to cause the strain, and I have no doubt there were thousands of different apparati of some kind in existence before we made ours.

John C. Trautwine, Sr., the originator of the "Trautwine Hand Manual," told the writer he had been testing materials nearly all his life. He would test wood and iron in a very crude way, but fairly accurate. I might say, for the benefit of those who know the name of "Trautwine," that he said all the tests he made he would keep records of and file these records in his office. Before the close of his life he thought these results might be helpful to other engineers, and he compiled them and issued a volume containing these tests. After we began making testing machines he used to come to our works and make tests to confirm or correct the tests he had made before, and he acknowledged he received very valuable data which he introduced in his later editions.

As far as I know, and I am quite sure of it, the first machines used by the United States Government were called the Wade machines. They were designed by Capt. Wade many, many years ago, for testing specimens of very limited size. I remember there

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was one at Washington Navy Yard, one at A. Whitney & Sons Car Wheel Works, and, I think, one at Boston Navy Yard. There may have been others, but I have never heard of them. The evolution of testing machines is quite as marked as the evolution in the first steam engine or the first locomotive, bicycle, automobile, or any appliance of the kind. At first the manufacture of scales, in which we were extensively engaged, brought us into touch with a very fine set of men, such as railroad engineers and parties who required scales in their business, and those who used scales in elevators, rolling mills or railroads, and when we gave more attention to testing machines it brought us in contact with a host of scientific experimenters, mechanical and civil engineers, professors of colleges, Government officials, and even the Congress of the United States itself.

As I now recall some of my experiences, extending over a period of many years, they impress me as being very varied and interesting. I refer to the gradual development of my business, especially to the progress of the testing machine part of it.

Our first inquiries came from manufacturers and users of iron and steel. After a while the colleges inquired for testing machines; they instituted physical testing laboratories, installed testing machines, by the aid of which they instructed their students both in the mechanical and civil engineering classes. Some of the professors also made some experiments, sometimes with assistance of the students, which served to give them practical knowledge and helped them as much in their mechanical education as they learned from their lectures and text-books.

And then the railroads first instituted physical laboratories and all the materials that were purchased were tested, examined and proved in the Department of Physical Testing, before accepting them. I might say right here that the properties of many of the articles required by railroads, namely, oil and coal, greases, etc., undergo severe tests and the most critical scrutiny. For example, the head of the laboratories of one of our largest railroads told me that by examining the qualities of coals from different mines and different brands of oils, he saved for the company, by recommending certain coals and oils, over a million dollars (this was in one year), so that the department of testing is not a useless one.

Our first orders for testing machines came from Philadelphia and vicinity, then from throughout Pennsylvania and territory near Pennsylvania, in New York and New Jersey. After a time inquiries came from all parts of the United States, and then from foreign governmental departments. This growth as to the terri-

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tory, and then as to the variety of machines being required, was simply phenomenal.

I am not referring to the number of machines sold, because they are not as extensively used as some may imagine. We could not in our business turn out the quantity of output that a works making steel rails or similar articles that were used by the thousand and thousands of tons.

Another interesting and noticeable experience was receiving orders from great distances and from parts of the world that we thought were hardly civilized—such as Honolulu, New South Wales, China, Philippine Islands, South America, etc.

Again, some orders would come to us in a very small way from some of the poorest colleges that are in the United States. We refer to the Agricultural State Colleges. Some of these had quite a number of students, who were miserably housed, with only a few professors, but they had received from the United States Government large tracts of land. After a while the lands that these colleges owned became exceedingly valuable, as railroads traversed them, villages and cities sprang up, and, of course, population increased very greatly. These same poor colleges became the richest colleges and sent us larger orders for machines than many of the colleges that were formerly our best customers.

One of the most complete railroad physical laboratories is that of the Pennsylvania Railroad Company, whose principal works are at Altoona. The Riehle testing machine was the first make installed at these laboratories. The testing machines of our make satisfied them and we have been receiving orders from this point ever since.

About twenty-five years ago a customer came to see us about a testing machine. He wanted to have it installed in a part of the building where there was no power that could be applied by belt or pulley, so we asked him, "Have you electric current in your works?" He said "Yes." We told him that we could arrange to run the machine by motor, which we did, and sold him the machine.

This was the very first testing machine that was driven by an electric motor. This machine proved a success and since it was built the number of machines gradually increased, until now nearly all of the machines made at our place (except the smaller ones) are driven by electricity. This is quite a surprising experience when we look back to the time when we made the *first* machines "motor driven." At the present time we locate motors, when occasion requires, on different parts of a testing machine. For instance, the movable heads which hold the testing tools can

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be raised or lowered and are moved up and down by electric motor. These heads also need adjustment for long or short specimens.

The writer confidently asserts that motor-driven testing machines were first made at our works.

The writer, who had charge of the publicity department and advertising for our works, immediately noted in their catalogue that we made "Riehlé Motor-Driven Testing Machines."

The writer also lays claim to having adopted the method of calling different machines by a "telegraph code name" and used different words to describe every size, style and description of testing machines by a telegraph name. Each word describes a machine fully and completely, which would otherwise require us to quote several pages from our catalogue to explain in its greatest detail.

One will appreciate this scheme when it is realized how many varieties of testing machines there are. They are made, as noted in another paragraph, of the following types: Vertical, horizontal, automatic or autographic, operated by screw power or hydraulic power, and further details that are all interpreted by the use of one word, also indicating whether two, three or four screws are required.

We remark in our catalogue that if a customer uses a "code" word in ordering a testing machine, he understands that it covers every possible feature in the illustration in our catalogue and that is what we will furnish, and that is what he must accept and pay for.

We also have established a telegraph code to be used when ordering, shipping, as to payment, time of delivery, etc., in the greatest detail. Also for communicating with our agents, correspondents and salesmen, representing the company, wherever they may be, at home or abroad.

Special attention has been given in perfecting the Riehlé testing machines. Simplicity of construction is kept in view; also the machine is designed so as to have every part of it accessible, for repairs or cleaning the parts or erecting or dismantling. We are particular as to the matter of liberality and quality of the materials used, and are not indifferent to the importance of putting the highest possible finish on all the parts, whether they show or do not show; also as to grace and style in the lines of the completed machines.

Without proper caution and fulfilment of all these requirements it would have been impossible to remain in the same business for fifty years and over. I think this will be conceded by anyone.

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One peculiar experience that I have observed is the capricious character of the public demands.

Since starting this business we have dabbled in almost everything possible in the mechanical line.

At one time we made what was called a Riehlé-Robie patented screw jack. We sold these at one time almost as fast as we could make them, when all at once the inquiries ceased, the trade in those articles decreased, and now we make none. Probably if we had not had the testing machine business increasing all the time we might have bent our energies to the screw jack and have had better results.

We had a similar experience with the Riehlé marble moulding and countersinking machine. These were used for moulding the edges of marble used in wainscoting and also for countersinking the tops of marble wash stands. This business flourished for a few years and it seemed every marble works wanted one. After a while the sales diminished and now we have no more orders for them. This can be accounted for by the use of tiling around the wainscots in large buildings, instead of marble, and the countersinking machines are no longer needed, because of the introduction of porcelain wash stands. We can usually trace the causes of these experiences.

Our foundry has proved quite satisfactory in its work, and although this is a very insignificant part of our business, we have a very good trade among people who want especially fine iron castings. We used to run the foundry three or four times a week and had but few customers, and were losing money in it. We learned from some of our friends that if we ran the foundry every day they would use our iron castings. So one day the writer called the foreman (who has been with us for thirty-eight years) to run the foundry every day, and go around and visit our customers and tell them of the fact. The consequence was that we had plenty of work and have now been running the foundry every working day for about twenty-four years.

Anyone who may visit the United States Mint at Philadelphia will notice in the coining room one or two dozen coining presses. Mr. Landis, then Superintendent, drew the attention of the writer to these presses and said they are made from iron castings made at the Riehlé foundry. The Superintendent has these presses kept in good order. They are highly polished and shine like silver. If the castings had not been very superior, they would not have been susceptible of high polish.

The Riehlé Company has always taken advantage of important Expositions, and had a fine display at the Exhibition of the Franklin Institute, held in Philadelphia in the year 1868, of the

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Centennial Exposition of 1876, and in the Columbia Exposition in Chicago, in 1893. We have been in other Expositions, but these are the principal ones.

It seems almost impossible to realize that the first Franklin Institute Exhibition that we attended was held in the old Pennsylvania Railroad Freight Station, at Thirteenth and Market streets, where Wanamaker's Store is now located. We had quite a display, which attracted considerable attention.

Testing machines were something new at that time, not only to ourselves, but to the public. A great deal of explanation was necessary to show the people what they were made for and how to perform the work which was required of them. We made some tests of material to show the visitors the use of the testing machine and they seemed very much interested.

One of our first and best friends was Professor R. H. Thurston of Stevens Institute, Hoboken, N. J., who bought and used one of our earliest style testing machines and recommended that we enter one of these machines in one of the Fairs of the Mechanical Institute in New York City. This was about the year 1866 or 1867.

At this Fair we were awarded the first medal for testing machines that was ever won in this country.

Our friend, Professor Thurston, always recommended the Riehle testing machines to everyone who applied to him for reference, whether from the Government or railroads, college professors, engineers, etc. The writer looked upon him as among his most valued friends, and that he did more to have the Riehle machines introduced than any one person he can think of. Our friendly relations continued to the day of his death.

I might say that wherever the Riehle testing machines were shown at any Exposition, they received the Highest Award, viz., at the Franklin Institute Exhibition held in Philadelphia in 1866 and in subsequent Franklin Institute Exhibitions; then at the Centennial in 1876; the Atlanta Exhibition; also one held at New Orleans, and then at the Columbia Exposition held in Chicago in 1893.

At the Centennial Exhibition in Philadelphia, in 1876, we made a still larger display, which covered quite a good sized space, and we had more machines, that were of greater value than we had shown previously. The Centennial Exposition doubtless brought us into more prominence, both at home and abroad, than any other Exhibition we ever attended, excepting possibly the Chicago Exhibition of 1893. These Expositions were visited by many thousands of persons and our exhibit attracted the attention of a great many visitors, men of public renown and scientific

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attainments, Army and Navy officers, and professors of colleges, etc.

We made special efforts to improve our machines, and with very favorable results. It is said that some one asked Mr. Baldwin "What do you consider the secret of your success?" He replied, "Every locomotive that we make is better than the one we made before." This would apply with equal truthfulness as to the Riehle testing machines.

Another cause of our success is that we invite from our mechanical friends their most exacting criticism, whatever it may be. It matters not to us, and we try to profit by it.

We take some pride in noting that we have passed through seven severe panics; but, by our conservative methods of doing business and not straining our financial ability, we have never had occasion to re-organize or borrow money, excepting upon the very best of securities as collateral.

A WORD ABOUT OUR SUPERINTENDENTS

The writer claims no mechanical education or skill whatever, merely being the capitalist and the manufacturer. All the designs of testing machines and other mechanical devices are made by our draughtsmen under our Superintendents. Our early Superintendents had the advantage of the recommendation and experience of some of the most brilliant mechanics in the United States, and elsewhere, in designing machines. It is strictly an evolution and no one person deserves credit for the changes that have been made in testing machines in the last fifty years. We might say, however, that the Riehle machines have been more improved and developed at our factory within the last twenty years and more devices for special and peculiar service in the line of testing in the last two decades than formerly. Some of our Superintendents were skilful, but not comfortable to get along with; others, again, were comfortable to get along with and were skilful, but were lacking in ambition and did not make strenuous efforts which are necessary to put forth to make any great headway in any line of business, particularly in improving testing machines.

The writer's motto, and one which he desired to impress to his Superintendents, was "that the best is bad enough." Namely, that he wanted their best endeavors and that the results would only be favorable under their best efforts.

One of our Superintendents was entertaining some prospective customers and had for refreshments a quart bottle of whiskey and a half a dozen tumblers. He was endeavoring to close a contract and injected into it some provisions that were objectionable,

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viz., he agreed to have a penalty paid in case the machine was not finished in time. The writer happened to drop in at the office during the course of negotiations and inquired how matters stood and learned how the prospective customers dictated the terms of the requirements. He asked the Superintendent to please hand him the unsigned contract which was under contemplation. He took it in his hands, read it and tore it in half and handed it back to him (the Superintendent), and said, "That ends our negotiations." The prospective customers were very much surprised and retired. We shook hands and parted. Our friend, the Superintendent, went to his home that afternoon, and I have never seen him since. Thus things move along with experiences of all kinds, and at all times.

REMINISCENCES—BUSINESS

WHEN our scale works and foundry were at Ninth street, near Coates, now Fairmount avenue, Philadelphia, we were near neighbors of the firm of Powers & Weightman, who were at Ninth and Parrish streets, about a square away. We made scales and iron castings for this firm and we frequently went to Mr. Weightman's office to get orders and to collect our accounts. In those days we often had occasion to borrow money and we used to go to Mr. Weightman's office and ask him for the loan of some cash for a few days. To tell the truth, we used to be obliged to see him upon this subject quite often, especially at certain times of the year when we needed money most. Mr. Weightman never refused, and after listening to our story quietly and patiently he would reach around to one of his many fireproof safes and open the door, and get out one of his fat pocketbooks and pick out banknotes for the amount that we needed. Mr. Weightman never gave me a check, but always the money, and required of me a check, which he would hold for a few days, until we would call upon him again and tell him to use it. Mr. Weightman was very fond of flowers and generally had a cluster or two of very choice blooms.

I recall many experiences with men and incidents and can only refer to a few.

On many occasions we were invited to go to some one or other of the Government stations and consult with officials, also engineers, contractors and others, about designing and constructing testing machines of various types. In fact, we were constantly being called to different points upon the same business.

Of course, I want it to be distinctly understood when I speak of being consulted in mechanical matters I am referring entirely to those in our works in charge of the designing and draughting department, our Superintendents and others.

The writer is merely the President and capitalist of the company and makes no claim to being mechanical, either by taste or education.

One day a gentleman came into our office and said he would like to have a testing machine constructed that would test very diminutive specimens of metal. As near as I can recall, he wanted to test tensile specimens of iron and steel about half an inch long. This gentleman said, as he walked into the office, "I am Doctor

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Dudley of the Pennsylvania Railroad, and when you have completed this machine, which I have ordered, will you please send it down to my private car, which will be stationed on one of the tracks of the Pennsylvania Railroad, near Philadelphia." The writer inquired, "What in the world do you want such small specimens for?" He replied, "I am taking these specimens out of railroad track rails. I take some from the top and some from the bottom and each side of the rail and will test them both physically and chemically." Thus he could observe the condition of the metal and from these observations make reports to the other officials of the Pennsylvania Railroad and upon these reports and recommendations, specifications would be drawn up upon which those who made and furnished the rails to the company would have to conform.

Hundreds of interesting incidents like this were constantly recurring.

Several gentlemen called upon us upon one occasion who were foreigners and who had to bring an interpreter with them. These gentlemen were prominent officials in Japan and held offices of trust and responsibility in one of the mechanical bureaus where matters in the mechanical department of the Japanese Government were inquired into. They explained that they desired to inquire into the design, uses and costs of different forms of Riehle testing machines.

We have frequent visits by officials from Russia and other countries.

These and many other visitors asked for our catalogues for examination and future reference.

Monsieur Clément paid us a visit one time and brought his Superintendent with him. The latter understood English and had to interpret everything we said to his principal. This gentleman is a prominent manufacturer in Paris and at that time was making bicycles, and since then is building automobiles, viz., the Clément-Bayard machines, which are well known and largely used on the Continent. He was an especially courteous gentleman and said before leaving our office, "If you ever come to Paris, you must be sure to come and see our works." About ten years after this incident I was in Paris and, recalling this very cordial invitation, went to see him at his works. I did not find him there, but he sent word that I should come to his villa at Nueil, a short distance from Paris. I drove over to his villa and found him at home. He was in the library of his home with a foot bandaged up from an accident which temporarily prevented him from walking. We talked over his visit to Philadelphia and to our works, and he informed me he was using the machine with satisfactory

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results and that he was delighted that I called to see him. After we had been talking a few minutes, his daughter, who was in the room, excused herself and left, but soon returned bearing a tray with some wine and served us with her own hands. I call this true French hospitality. This lady remained during the interview and when I was about to go she acted further the part of hostess and showed me through some of the rooms of the villa, explaining the works of art and many valuable paintings which were on hand at every side. Fortunately for all concerned, I had taken the precaution to have an interpreter with me, otherwise the visit would not have been so successful.

Before leaving I asked about his son, and he told me that all the young men in France had to serve a few years in the Army and that his son at that time was in the service of the French Government. He said that through his influence he obtained the position of chauffeur to the President of France.

I invited him to call and see me, if he ever came to Philadelphia again, and extended the invitation to his son and also to his daughter. He said, "My son will be in your country in the autumn and purposed taking one of his machines with him to enter it in the Long Island races." This was in 1906. He seemed to be proud of the machine and of his son's career, and was anxious to secure for himself and the machine the credit of winning the races. He was elated at the possible success.

To show how soon joy can be turned to sorrow: In the fall I looked in the newspaper and saw an account of the Long Island races and noted with a great deal of pleasure the entry of the Clément-Bayard machine, and that it was to be run by the son of the maker. The day after I had read the above notice, which was at the beginning of the races, I saw, to my sorrow, in one of the New York papers, that this young man, Clément, whom I had last seen at his father's house in France, was instantly killed in a collision in one of the races. This is a sad reminiscence, and one which I shall likely always remember.

One of our earliest experiences, when testing machines were new to us and everybody else, was to receive a letter from the President of the Wyandotte Rolling Mill Company, Wyandotte, Mich., Captain E. B. Ward. The letter contained an order for a testing machine, which read about as follows:

"Please make for us a testing machine of 100,000 pounds capacity, for shearing the rivets in boiler plates."

We acknowledged receipt of the order and started to design and construct this machine. Our then Superintendent proceeded to design and make drawings and patterns for the cast iron work, frames, beams, levers, and all other necessary parts. This natu-

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rally took a great deal of time and, of course, intelligent thought and elaborate calculations. We had but a few men in our shop at that time and this order meant a very big contract. The result was it took us just one year from the receipt of this order to complete this machine, when it was tested and shipped, and it arrived at Wyandotte in due course of time. We received a letter from Captain Ward in a few days acknowledging the receipt of the machine. He wrote us that he was astonished at the time it took us to plan and build the testing machine and as to its bulky proportions, as he had no idea it would be such a large machine. What was especially surprising to him was the size of the bill, which was about \$3,000. He thought it would be a small machine and would cost \$600 or \$700. Notwithstanding his surprise, he sent us a check forthwith for the amount. This machine, from last accounts, is still in operation at the Wyandotte Rolling Mill. Experience of this kind was an almost daily occurrence and was but a beginning of many instances that we recall in the construction of testing machines.

At one time during the Centennial year (1876), as it was called for a long time, we received a check for \$1,000 from the University of Tokio, Japan. The order said, "Please make us a 'Vanderbilt' testing machine for the University of Tokio; enclosed please find payment in advance." This machine was duly made and delivered, was installed and gave great satisfaction, and was the beginning of many orders from this far-off land. We made this particular style of testing machine first for the Vanderbilt University, and it was our wont to name a machine after the name of the party or place who ordered the first machine of a new design.

About thirty years after this machine was bought and delivered, I met a Mr. Crawford, who now lives in Philadelphia, and asked him if he was the gentleman who wanted a machine for the University of Tokio. He replied, "Yes." He was a Professor of Engineering at the University at that time. He said it did its work and he was very well satisfied with it. He further said that it was recommended by a college mate of his. He remarked that he received the machine just one year after he sent us the check.

The writer occasionally called to see parties who had inquired about testing machines and upon one occasion went to Pittsburgh and called to see the firm of Carnegie & Kloman. He found Mr. Carnegie and Mr. Kloman, his partner, in their office. I explained the machine as well as I could, told them who we had sold them to, price, etc. After quite a lengthy interview, I secured the order from Mr. Andrew Carnegie for one of the old style 40,000-pound testing machines for testing boiler plates.

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Since then we have had the pleasure of meeting Mr. Carnegie and recalled this interview, which he said he remembered. It took him longer to spend this \$700, the price of the machine at that time, than it takes him nowadays to give away a million or two. This was about 1867.

In my business connections as manufacturer of testing machines I have experienced some of the most delightful surprises. It is a partially scientific branch of manufacturing, hence it has been brought into contact with officials and others of scientific attainments and large experience in mechanical lines.

We have been honored by visits from some of the most distinguished persons of the United States or, in fact, of any country.

I recall a visit from a quiet, modest-looking gentleman, who said he would like to consult us in regard to a testing machine. We invited him into the office and asked him to be seated, and at the first possible appropriate moment said to him, "May I inquire your name?" He replied, "I am Captain James B. Eads, formerly engineer for the St. Louis Bridge Company." He said further, "I want to procure a testing machine to test the materials I purpose using in carrying out the contract with the United States Government to construct the Mississippi jetties."

Of course, our recollection of this interview was most agreeable, and he purchased a machine of us and it was used in this notable work. Many other subjects of conversation were touched upon during the visit and altogether it was a very pleasant one.

Just here the writer would say, there is usually a marked contrast in the demeanor of whom are acknowledged to be "great men," as compared with those who are superficially educated and have a better opinion of themselves than others have, who are often egotistical, generally self-complacent and abrupt in their manner, and disagreeable generally. I feel assured that these comments about the characteristics of "great men" express the opinion of all who may read these pages.

At one time we were called upon by Admiral W. S. Schley, U. S. N. He was a dignified, quiet gentleman, and one whose visit we will always remember with great pleasure. He said, "I have seen and used a great many of the Riehle testing machines and I want one made with a slight change in the design." He wished more space on the platform for room for larger specimens than were provided for in our regular machine. He suggested, and gave us the measurements he desired us to arrange for between the screws. We accordingly designed a machine for him, furnishing drawings and specifications of a vertical screw power testing machine of 200,000 pounds capacity. This design was accepted by the Admiral and we received an order for same.

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which was duly filled to his satisfaction and also that of the United States Government. We named this machine the "Schley," as we often named machines made for any particular persons. This style type of machine was used for several years and it gave our other customers very great satisfaction.

Many years ago we had a visit from the officers of the Midvale Steel Company. If I remember rightly, Mr. C. J. Harrah, President, called with his Superintendent. They said that they were obliged to buy a testing machine to fulfil conditions necessary to make steel for the United States Government. Mr. Harrah expressed himself very forcibly to us about this arbitrary action on the part of the Government, and seemed disgusted at being obliged to be hampered in this manner. He, however, ordered a machine of us. He insisted that it should be finished in a special manner and that it should be painted vermillion and striped and ornamented in gold leaf. We strongly objected to this style of finish, because we thought it was not in harmony with our ideas of how a machine should be painted, but he insisted on it and we complied with his views and have had no cause since to regret it. This is certainly the best-cared-for testing machine that we have ever heard or known of. It was kept almost as one would keep a parlor ornament. I think it is still in use at the physical laboratory of the Midvale Steel Company at Nicetown. This company has since procured another machine of us, of much larger capacity.

The Riehle machines have always stood well in the favor of the Midvale Steel Company and they have made such good records that they have been placed in all similar works in the United States, I think without one exception. I might add right here that after this first machine had been installed and used, Mr. Harrah changed his mind about objecting to being obliged to make steel according to specifications and admitted that the results were very much in his favor, and the competition thereafter was based upon quality and not upon price, and he has been fully repaid in installing testing machines and could not be induced to do without them under any consideration.

This has been the experience, I think, of nearly everyone using testing machines.

Mr. Frank J. Gould called at our office one morning and said he wanted to buy a testing machine and present it to the New York University, where he was a student. He purchased a Riehle testing machine of 200,000 pounds capacity and presented it to the University, where it is still in use.

The above is only one of many instances that are occurring all the time. At one time we were visited by one of our valued

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friends, Professor A. N. Talbot of Lafayette University, Indiana. He also helped to design and purchased a large vertical screw power testing machine, which we called "The Talbot" in honor of the person who ordered the first machine. The machine we made for Mr. Talbot has been the means of our securing other orders.

Another pleasant experience I recall was that of a visit of Mr. John Fritz of Bethlehem. He had planned to pass his name down to posterity in the form of the John Fritz Memorial Physical Laboratory, and he selected the Riehle testing machines. This laboratory building is one of the largest buildings of the Lehigh University of South Bethlehem, Pa.

Mr. Fritz was a practical mechanical engineer and known all over the world as the first man to introduce the manufacture of steel rails in the United States at the Bethlehem works.

Mr. Fritz's position was unique. He was honored by all of the scientific men of mechanical attainments all over the world, and at home his friends and neighbors called him "Uncle John." His memory stands before the world the same as John Muir as a naturalist, John Burrows in natural history, as Bessemer in steel, abroad, and as A. J. Holley in the United States, and Spurgeon in England, and Phillips Brooks in America, as theologians. I intend no disrespect to those names I have omitted, but it would take too much space to name more.

Mr. Fritz had his own ideas about a testing machine and wanted one made just to suit himself. He used to come to our works, go up stairs to the draughting room, and together with our Superintendent, head draughtsmen and others would sit around a big drawing-board and talk over and sketch out the changes he desired to have made on one of our big testing machines.

As usual, on such occasions, there were differences of opinion and quite exciting but very pleasant arguments. We designed the machine, made the changes he desired, and he purchased it. This machine was constructed and erected in the laboratory at South Bethlehem. It was built entirely of steel. I might say that we have placed several of the Riehle testing machines in the John Fritz Laboratory.

The largest machine for Mr. Fritz, built entirely of steel, is a vertical screw power 800,000 pounds testing machine. It has attracted a great deal of attention and it performs its duty so well that it was highly appreciated and secured for us several orders.

This place is visited by many of the leading mechanical engineers and other officers in large manufacturing companies, and, of course, by our professors of colleges, etc.

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Sometimes, when our mechanical friends were discussing testing machines and making sketches and arguing around one of our large drawing-boards, most exciting discussions took place, and it sounded more like a political mass meeting than a mechanical discussion, the excitement was so great. In warm weather some of our distinguished guests would cast off their coats, vests, collars, neckties, turn up their sleeves and get down to hard work, and the fun began.

In mentioning the names in this paper of some of our friends it must not be understood that we are ignoring the mention of other friends and acquaintances, but it would be impossible to name any number, as you can imagine in fifty years the list would be too long to put in print; further, all of the above is written merely from memory. The writer has not looked at a memorandum or any of the books, but just as the instances come to his mind.

At one time a fine old gentleman, and one of our customers for whom we had been making tests, dropped in to see us. He said, "Many years ago you made some tests for our firm and I am wondering whether you keep a record of your tests and could find this particular one and give me a certificate." The writer inquired of our testing engineer if he could find the record of a test of this firm of a certain date. We overhauled our testing records and found this particular test in one of our old books. Our expert made the duplicate certificate and gave it to me and I passed it on to this gentleman. He took it in his hands, looked at it and said, with a voice full of emotion, "Mr. Riehlé, this certificate is worth \$6,000 to me," and thanked me again and again for it.

A while ago a prominent company notified us that they would send to our laboratory twelve or fourteen "brake beams" for us to test, but not to make the tests until we had informed them that the articles had been received and when we would be prepared to make the tests, naming a fixed date, when some of the officials would come on to witness the making of the tests. It seems they ordered from nearly every maker of this particular part of a car to send a "brake beam" to our works, and then, we think, some private-designed brake beams were also received by us. At the time appointed—I can recall it as though it were yesterday—a host of elegantly dressed, high-hatted gentlemen came up from the Bellevue-Stratford and almost took possession of our laboratory—and the test lasted several days, during which time they took copious notes. It was a very pleasant experience and we tried to entertain them as well as we could, and after the tests were over they thanked us for our courtesy and the visits terminated in a most friendly spirit. I recall one of the gentlemen said that one

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of the makers of these articles refused to send one to be tested, unless he was personally present to witness the test. I might say that this condition was not satisfactory to our interesting friends and the brake beam never came, and I imagine they never sold one of their machines to this company.

I learned that the parties above referred to had been having some trouble with their cars breaking down with their products in transit. In this case one of the cars in the train broke down, caused, I think, by a weak brake beam. It was a train of cars, most of them filled with oil, and a great deal of material was wasted, involving the loss of a great many thousand dollars.

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IN looking backwards over a series of years the past seems to the writer almost like a dream.

One of the first very important events that I can bring to my mind was the construction and completion of the Atlantic Cable.

This occurrence caused the greatest excitement possible and, of course, constituted an international epoch.

Mr. Cyrus W. Field, who was the principal promoter of the cable, when it was completed sent a message over the sea, or more correctly speaking, under the sea, to Queen Victoria. The message was, "Glory to God in the Highest, peace on earth, good will to men," and congratulations to the Queen, who made an appropriate response; the words of which I cannot think of just now.

Then the Civil War took place. I can remember now, although I was quite a young man, the intense excitement there was throughout the country. People were talking about it. Newspapers were full of it and recruits were called for, people enlisted, were equipped and sent forward to Washington.

Crowds of men, full of enthusiasm, walked up and down the streets in the centre of the city and made every business house fling their flags to the breeze, and decorate the fronts of their stores with red, white and blue bunting. At that time business was very bad, many people out of employment and the depression was keenly felt throughout the country. Everybody who had nothing to do, and others who left their business, for patriotic reasons, enlisted.

At one time I had thirteen first cousins who went to the war. I remember that I raised the money to equip most of them with at least a sash and sword. I refer only to those who were officers. A friend of mine who had five boys sent them all to the war and they enlisted as private soldiers, but were promoted to the rank of captains and colonels and acquitted themselves with honor.

Then one morning the nation was stirred from centre to circumference; in fact, the whole world was equally shocked when the news was received from Washington that "President Lincoln was shot." He was attending a play at Ford's Theatre. I think the play was entitled "The American Cousin," when sud-

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denly his assassin, J. Wilkes Booth, entered the rear door of the Presidential box and shot the President, in the view of all the audience. He then jumped from the box down to the platform and in doing so his leg caught in the decorations of the box, he fell on the stage floor and sprained his ankle. He stood up, waved the Confederate flag and cried out, "Sic Semper Tyrannis," "thus always the tyrant." Booth then made his escape through the scenery to the back door, where his accomplices were waiting for him on the street, and he eluded those who attempted to catch him and escaped. This was just at the beginning of the second term of President Lincoln. The nation was terribly depressed and the atmosphere was heavy with suspense. There were surmises that something would happen that night and the President was cautioned not to go to the theatre, but he with his big heart, not willing to disappoint the people, attended the performance, which proved fatal to him and a calamity to the nation. His special aide was not in his place. Some one called him, likely intentionally, and he left his post for a moment, when this sad event happened.

Only the other day I was speaking to a friend who happened to be at Ford's Theatre that very night. He was very near the Presidential box and saw every incident that transpired.

Every few years during the last fifty, most terrible and tragic events took place, each one causing a severe shock throughout the entire world, all of which made deep and lasting impressions on the writer's mind. I am referring to the above and to the tragic deaths of Presidents Garfield and McKinley and some successive events that I happen to recall, but these were more important than many others that occurred.

One morning I was in the office of our store which was then on Fourth street, above Chestnut, when a young man came in from across the street, where was the office of the Bell Telephone Company, and said, "I wish you would allow us the privilege of installing a telephone in your store, and also one at your works, Ninth street above Master, Phila." He said, "You can talk into the receiver in the store and they can hear you at your factory just as plain as if you were talking to each other in the same room." He said, "This is a fact, if it does not do as I tell you, you need not pay for it, we will take it out." I said, "Do you mean to say that I can talk to the factory, and they will hear me as plainly as you hear me now?" He replied, "That is the fact." Said I, "Please do it at once," In a few days the phones were put in and worked to our satisfaction. Our phone number for the store was No. 50.

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I mention all this to inform my friends that our phone was the fiftieth in use at that time, only forty-nine being ahead of us.

About forty-five years ago, it may be a little longer, one of my uncles, Charles H. B., with some other prominent citizens, went to Harrisburg, Pa., for the purpose of influencing the officials at that place to prevent the introduction of illuminating gas in the city of Philadelphia. They thought it would be very dangerous to have the gas pipes placed in buildings and homes and that the gas would cause explosions. One of the members of the party was Doctor Cresson, it is strange to say that this same gentleman, not long afterwards, was appointed Superintendent of the Philadelphia Gas Works.

A few years after that, my father went to Harrisburg with some of our neighbors to enter protests against the introduction of building and running street passenger railway cars in Philadelphia. They thought it would injure real estate and become a nuisance generally. The first railroad built in the city of Philadelphia was the one on Fifth and Sixth streets. This went past our house and we thought it would depreciate the value of property and prove detrimental to the interests of the citizens. The people were at that time conveyed through the city in two-horse omnibuses. Both means of conveyance have since passed away and we now have the trolley system.

One of my great aunts, the widow of Captain R., lived either next door or very near to Stephen Girard's house. She use to talk to us about old times, and said she knew Stephen Girard and that upon several occasions she was asked by him the loan of her teapot. These are homely incidents, but just show in what a primitive manner the people, and the very best people in the land, conducted themselves, one with another in the most neighborly way.

One of my grandmother's, who used to live on High street, now Market street, near Fifth, mentioned as a common occurrence seeing General George Washington pass back and forth in front of the house. He attracted not very much attention; the neighbors all knew him. He was very cordial with everybody, notwithstanding he was very dignified.

Carpenter's Hall is on Chestnut below Fourth and Independence Hall is on Chestnut between Fifth and Sixth, and General Washington passed our grandmother's house in going back and forth between his home and these places. Both were naturally interesting landmarks in early colonial history and are still places of veneration and frequent visits by everybody who comes to Philadelphia, and who are interested in these shrines of liberty.

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I think but few people know that one of the buildings of the University of Pennsylvania, which was formerly on Ninth above Chestnut, was built to be the Presidential Mansion of the United States, which is a fact. Of course, this building has been removed years and years ago.

In the year 1859 my father thought his health would be improved if he lived in the country, and purchased a property at Valley Forge, Pa. We lived there for about ten years and after my father died, some of the children left home, and as there were only a few left in the family circle, the property was sold and we returned to Philadelphia. This property is at present owned and occupied by ex-Senator the Honorable Philander C. Knox, who bought it several years ago.

We were told that this house was the headquarters of General Knox, I think he was some relation of Senator Knox's. It is claimed that Lafayette in revolutionary times also lived or was entertained there, so it is not without historic interest. I remember distinctly that our farmer would occasionally plough up a bayonet and small cannon balls. In fact, this was a frequent occurrence. Some few years ago the former owner of this Valley Forge home was in Paris with his family. The fact of his having lived in a house where General Lafayette had his headquarters became known and upon the occasion of the great Lafayette celebration, I think about twelve years ago, this family received special favors. They were entertained by the most prominent people in France. They were waited upon with the greatest consideration. They were guests of honor at all the banquets and had the best seats in all public functions during the term of this celebration. In fact, they were in the limelight for quite a while, much to their surprise and enjoyment.

In 1784 my great grandfather, who was a merchant, had his store on Market street near Sixth, and upon one occasion one of his customers came to Philadelphia, paid a visit to my grandfather and had sad news for him. He stated that he was in financial straits and was unable to pay my grandfather a small bill of \$700.

He said that he owned a tract of land in Schuylkill County, and that if my grandfather would accept the deed on this piece of land for the cancellation of the debt that he would be very grateful. My grandfather said that he would grant his request, and he became the owner of this piece of Schuylkill County wild lands, as they were considered; this property is a few miles from Minersville. It is known as the "Ely and Riehlé" tract.

My grandfather and his descendants held this land for over one hundred years. The taxes were paid year after year and

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it was sold in the year 1884, being kept in the family for one hundred years. These lands were supposed to contain coal, but as the use of coal was not known until many years after the property was held by us, it had no great value.

My father and mother used to tell me that their friends, who also owned anthracite coal lands, would frequently come to our house and bring small pieces of coal with them. They would sit around the grate where wood was being used and throw these pieces of coal on the fire, to see what would happen. Sometimes a draft met the coal and caused it to burn, and at other times the pieces of black stone, which they were called, would drop down unconsumed and it was thought that anthracite coal was of no value.

Anybody who had coal lands, or expected anything of value from the use of these pieces of black rock, were considered as laboring under a delusion and thought of about the same as the people used to think about those who were talking about flying machines.

So one generation laughs at another, and we are often surprised at our experiences and strange occurrences and I frequently think that "the unexpected is sure to happen."

In our case the "ground containing the black rocks" that my great grandfather bought, turned out to be a very good thing for us. The \$700 investment realized \$225,000.

When we lived at our Valley Forge home we had many strange incidents to occur.

At one time, someone rang the front doorbell, and asked us if we could designate the tree under which General Washington prayed. This gentleman had a party with him in several conveyances. They had driven quite a distance to visit Valley Forge, the scene of such a dark period in the revolution times and he said they were anxious to see this tree. We replied that we were not sure, but pointed out a big chestnut tree on our lawn as probably the tree that George Washington used. This was the oldest tree in the neighborhood and we thought it more likely to be that tree than any other.

Another amusing incident was that at one time when our carriage and pair of horses were waiting before the door for us to get in, my brother had occasion to run into the house to get a straw hat or something of the kind, and when he came out he found no horses and carriage. Kate and Fan, our old family horses, thought that we were either in the carriage or ought to be, trotted down the avenue through the gate and to the main road and over the bridge at the creek, and up the road and were trotting along up the hill when we happened to notice them. We

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raced across the lawn and through our neighbor's property just in time to head them off. They were not running, but simply going at a decent Sunday trot and nothing was disarranged in the slightest degree. My brother caught them, turned them around, came back to the house, and we all had a good laugh over it. I think even the horses enjoyed it. We have all heard of horses laughing.

Another amusing incident took place when my father and mother were obliged to go to West Chester, to sign the deed to the property which we had just purchased. They started off in a Jenny Lind wagon we had and we bid them good-bye, expecting to see them before night. West Chester is about twenty miles from Valley Forge and is quite a trip for old folks. After they had gone about ten miles, they wanted to be sure that they were on the right road, and inquired of some farmer whom they met, and asked him how far West Chester was. He said about fifteen miles.

They continued their journey and after riding about three-quarters of an hour, inquired of another farmer whom they met, how far off West Chester was. The man replied about fifteen miles. The old folks talked together about it, wondering where they had been going for three-quarters of an hour and made up their minds they would trust to their wits and not ask any more farmers.

After a while, they saw some steeples and houses in a distance and were so glad that they were on the right road and thought they would soon be at West Chester. When they were near the town they again inquired for the last time what town it was ahead, as they were going to West Chester and wanted to be sure they were on the right road. The man they inquired of said, "West Chester is twenty miles away; this place is Downingtown." My father and mother looked at each other aghast. Of course, they immediately returned home and narrated their experience. They didn't enjoy their experience, but there was nothing to do but realize what had occurred and take what enjoyment out of it they could. They started out the next day to go to West Chester, and I believe that all the family, including father and mother, really did have some misgiving of what might occur.

We were strangers to country life, and my father and brother took great interest in the springtime in the farmers' sales. These occurred sometime in the spring before the heavy farming work began, these sales were called Vendues. The sales included horses, cows and other animals, also wagons, carts, etc., household goods, dairy farm tools and useful articles.

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There were some great bargains in sight, and, in fact, many farmers purchased nearly all that they needed from time to time at these Vendues. The desire to buy things cheap has the same hold on city people as it does on country persons. Our folks used to bring home the queerest things—one cannot imagine the stuff they bought. We had no sleigh at one time, and I think we bought one for \$5 which we used and sold ten years afterwards for \$10 or \$15. We did get a first-class sleigh after a while, but this cheap sleigh did some good service for us. It had one advantage, it was so low to the ground and the runners spread so wide apart that I don't think an earthquake would upset it.

We used to have a high mound before the house, that we thought was fine, but some of our successors considered it a nuisance and cut it away. This mound served as an orchestral platform for two of our dogs who used to sit side by side and bay at the moon. The big dog's name was Bill and the little one named Pepper. Pepper used to sit side of Bill and look at him out of the corner of his eye, very much as the concertmaster of the Philadelphia Orchestra watches the leader. When Bill bow-wowed Pepper would join in. This was quite a frequent occurrence.

Their daylight experiences in some cases do not seem to have been as pacific. They used to trot off together, sometimes stay away all day, sometimes several days, and when they returned they looked as if they had been pretty badly used. I guess their plans of battle were not well laid out and they hadn't the proper reinforcements. They always seemed glad to get home, but never told us where they had been.

The team that brought some of our household effects from Philadelphia to Valley Forge was manned by colored gentlemen. They brought a dog with them, I presume for company. This dog was a good natured regular alley dog, not a yellow dog, but I might have called him a dark gingerbread colored fellow. Well, we bought this dog for \$2 and we used to call him our "Two Dollar Bill."

I remember on one occasion when at Valley Forge we were expecting our mother to arrive at the Centreville State on the Chester Valley Railroad in the afternoon train from Philadelphia.

Mother was not at the station when we sent for her and we presumed that she remained in our city home for that night. The next morning about half past nine, to our utter amazement our dear, gentle, lady mother came sailing up the avenue on the front seat of a farmer's wagon. We all went out to see her. She was very excited and scarcely knew whether to cry or laugh.

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We all said, "Where did you come from; where have you been?" When she could get her breath and become more composed, she said, "I came up in the afternoon train yesterday, and not noticing how long I had been in the train and being aware of the fact that we had gone so far as we had, and passed the station, I said to the conductor, 'Isn't it about time we were at Centreville Station?' He replied, 'Dear madam, we are just entering West Chester, and passed Centreville half an hour ago.'" My mother burst out crying, no doubt from the shock, not from any fear, and the conductor, whom we afterwards became very well acquainted with,—Mr. Davis,—said, "Mrs. Riehlé, don't bother, I will take you to a hotel where you will get your supper and can rest comfortably and you can get your breakfast and return in the morning, as there are no trains tonight and the first train to Philadelphia is early in the morning." It is unnecessary to say that mother never forgot the circumstance, and as the time went on we recalled this incident with mingled feelings of humor and sadness.

We had an old German woman at that time, and mother said to her, "Wasn't I stupid not to get out at Centreville? You would never do such a thing as that, would you?" Old Dutch Mary, as we called her, said, "No, indeed." She said, "Every time we stopped at a station, when I was coming up, all along the road, I said to the conductor, 'Is 'dis Centreville?'" One does not require much imagination to realize that such a nuisance would be gotten rid of as soon as possible. And she did get off at Centreville, sure enough, as a Southerner would say.

At one time, after we had sold the place, we were disposing of the furniture, carpets, etc., to Mr. P. The purchaser and his wife came up to Valley Forge to see what they could buy from us to advantage, and my dear mother would go through the house telling them of the quality of certain pieces of furniture, bedsteads, etc. She would say, "This is not real mahogany, it is stained." I was present and frowned at my dear mother as hard as I could, but it did not seem to have much effect.

At the same interview we went down stairs and Mr. P. looked at the oilcloth in the hall. Dear mother said, "This is a splendid piece of oilcloth; we have had it down for ten years, and it is just as good as new." At this information our friends, who were going to buy us out, laughed heartily and enjoyed the joke as much as I did, and a little more. I said, "Mother, you are a poor saleslady, and I am going to take your place and make you stay away and I will sell the other articles to our friends."

My mother had an uncle named Godfrey Haga. He was a merchant, something in the same manner, I imagine, as Stephen

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Girard, only on not quite as large a scale. He used to live on Chestnut street in a conspicuous mansion that stood back from the street, of ornamental design, and was called "Gothic Mansion." It was on the north side of Chestnut street, above Twelfth, the land having been since occupied by Concert Hall and more recently Chestnut Street Theatre.

His junior partner was my grandfather, William Boller. My grandfather on several occasions went out on their ships as supercargo. This position was frequently given to promising young men and they had an opportunity of making money and sometimes they accumulated quite an amount, sufficient to start them in business.

Godfrey Haga had peculiar notions about the uses of money, and when he died, which was about 1830, he left two nieces and two nephews. He gave the nieces \$1,000 each and his nephews nothing, saying they would be better off if they made their own money. He left the bulk of his fortune—I believe it was \$200,000 or \$300,000—to the Moravian Missions. My grandfather having had a ship out on his own account, failed to hear any news of it, and the disappointment was so keen that his health failed and he finally died indirectly from the effects. He, however, left a large fortune to his four children, although he died at the early age of 29.

I recall a strange episode which we used to enjoy talking about around the fireplace. Upon one occasion, some of our family admired a Chinese dinner set of porcelain. They ordered, for either my uncle or grandfather, another set to be made like it. They wanted the change in the color of a part of it, and they marked a certain part of the specimen piece, "Paint this red." After the new set of porcelain was received, all the pieces were marked, "Paint this red." They did not realize the Chinese were so close copyists as to carry out the instructions to the letter.

When I was a boy I became acquainted with a very interesting gentleman of Spanish descent and who was a practicing doctor in Philadelphia. In fact, he was demonstrator of anatomy at the Homeopathic College, which was then on Filbert street, near Eleventh. He was called Dr. John R. G. He gave his correct Christian names in English and adopted his last name, which commenced with the letter G.

One of my brothers had quite an aptitude for acquiring languages and wanted to study Spanish, and asked Doctor to come to the house and teach him Spanish. He did not come as a teacher, but my brother helped him in his English and he helped brother in Spanish, and quite an intimacy sprang up between

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them. This gentleman was of fine appearance and distinguished in every way in his personality, elegant manners, etc. In the course of a few years he married a Philadelphia lady and said to her father, when he asked for her hand, that his name was Juan Ramedes and that he was from Argentina.

Doctor, as I will call him, was one of the very first to enlist at the time of the Civil War. He enlisted for ninety days as a private in the National Guards and they used to drill in Franklin Square. One day he came to our house in full uniform and said, "I have enlisted today in the National Guards, to fight for my country." I looked at him and could not but help admiring him. He stood erect and the uniform became him and he looked every inch a soldier.

Doctor was honorably discharged from the National Guards, at the end of service, and applied for and obtained a commission as captain with Colonel Reichter Jones, who was raising a regiment at Roxborough, Philadelphia.

I would say here that the Doctor and Captain served the country faithfully and received an honorable discharge at the end of the war.

As I noted before, the Doctor married a Philadelphia lady whose name I might mention, but it is best not to do so.

At the time of the Centennial, 1876, among other distinguished visitors who came to Philadelphia, will be recalled that of Dom Pedro, the Emperor of Brazil, and the Empress, and a very large and distinguished company, and with a great retinue of attendants.

Among the distinguished party was the Princess Iturbide. During their stay at one of the hotels a reception was held. Doctor G. took his two children with him and they were presented to the Royal Family and to Princess Iturbide. They were received in the most cordial manner and Doctor Juan Ramedes called her by her first name, Elizabeth, and seemed on remarkably friendly terms. This was a great surprise to us and added to the mystery of his personality. He would never tell us about his family nor his full name, title or rank, or where he came from. He lived in Philadelphia on intimate terms with our family and many friends for over twenty years and this was all we ever did or likely ever will know of this distinguished person and his mysterious career.

I desire to mention some matters that likely very few people know. An Episcopalian clergyman of high standing said the other day to me: "Did you ever know that the Trinity Church of New York was offered to the Lutheran Church many, many years ago, when it was merely a dilapidated country church and farm land all around it?"

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The Lutheran Church was German and the old fellows likely put their heads together and considered the value of the property, the cost of repairing and keeping the church in repair and putting a fence around the property, and declined this offer. This proves that church people make mistakes in their actions as well as some other folks.

Another mistake that the Lutherans made many years ago, when Henry Melchoir Muhlenburg was a Lutheran pastor in high standing: He used to preach in German, to a German congregation, of course, as the younger members of the congregation were English-speaking and but few of them could readily understand the German language. Rev. Muhlenburg desired to make the church services attractive and keep the congregation in prosperous condition, realizing that these young people were the future prospective members of the Lutheran Church, and wanted to preach in the English language, if not every Sunday, occasionally and frequently. This privilege was denied him and so he left the Lutherans and became a member of the Episcopal Church. This was about as great a loss to the Lutherans as not accepting the offer of the Trinity Church property.

A word about the Episcopalians of Philadelphia. I think I can venture to say without contradiction that more than one-half of the members of the prominent Episcopal churches in Philadelphia are direct descendants of Lutheran parentage, or Quaker forebears. Nearly every Episcopalian would tell you that his father or mother or grandfather or grandmother was a member of the Lutheran Church. Most of them were members of St. John's Lutheran Church, now standing in Race street, below Sixth. This church is one of the handsomest examples of Colonial architecture in this city or in the country.

The Old Swede Church at Front and Swanson streets in Philadelphia, also the Old Swede Church in Wilmington, Del., were both formerly Lutheran. When the Swedes came to this country they found the services as conducted by the Episcopalians were more like the Lutheran services in Sweden and joined the Episcopal Church.

It may interest some of the readers for me to make some reference to the conditions in and appearance of the city of Philadelphia about fifty years ago. Also some remarks as to its growth and prosperity.

But few persons can remember the time when the Philadelphia & Reading Railroad Company had their passenger station on Broad street, below Vine. We used this station to go from Philadelphia to Valley Forge.

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The building was so dark that when the passengers were getting into and going through the cars to find the vacant seats it was absolutely impossible to recognize anyone in the cars, and it was not until the train was moved out into the street that there was sufficient light to recognize anyone around you.

The cars were drawn, one at a time, out of the station by a string of mules and they continued hauling the cars to the outskirts of the city, when they were unfastened from the cars and the train made up so as to be drawn out by the locomotive to its destination.

At the same time the principal passenger station of the Pennsylvania Railroad was at the southeast corner of Eleventh and Market streets, where the Bingham House now stands. The station was but a little better than that of the Reading Railroad, but was primitive in the extreme. The passenger cars were drawn out in a similar manner by a mule team to a point near the Schuylkill River, where the train was made up for the locomotive to haul.

I might say that the Bingham House is named after the family of Bingham who were at that time quite prominent. They had large interests in the Pennsylvania Railroad and Adams Express, and it was doubtless their connection with the company that the hotel was named after them. Colonel Bingham was the Superintendent of the Adams Express Company in Philadelphia and he was a good one.

In my early boyhood I remember when Broad street was paved only as far as Columbia avenue, North, and about Pine street, South. My friends remember when Spruce street was not paved and there were but a few residences west of Broad street.

Naturally, when new towns are started people locate near the river, or on the banks of the river, so that the greatest number of inhabitants of Philadelphia in olden times dwelt between the Delaware River and Broad street.

One can hardly realize that the time would come when the centre of the city would be about Sixteenth and Girard avenue and that Broad street would be extended North and South, making an avenue nearly thirteen miles in length. My parents used to live on Sixth street, below Noble, and when they moved there in 1825 they had to walk about two squares up Sixth street to a pump on which they depended for the supply of water.

At that time, where our factory now is, Ninth and Master streets, was farming land, and there were country seats all around that neighborhood.

A Mr. George Tryon, the founder of the Tryon gun store in Philadelphia, bought a tract of land in the upper part of the city,

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which extended from Ridge avenue to the Schuylkill River. The old mansion still stands below Diamond street, where the Pennsylvania Railroad transects it.

There was no park at that time, but in about 1860 Fairmount Park began to materialize, and we used to drive around Peter's Mansion up on the hill near the boat houses. The place is now known as Lemon Hill.

For many years after that the citizens were satisfied to drive out to the Park to George's Hill. This was considered a wonderful place and the Park was considered quite an extensive one. There was, and is to the present time, a concourse at George's Hill, overlooking the Park and part of West Philadelphia. At that time there were no dwelling houses visible in this vicinity, from this concourse. Now no one can see that part of the city for the houses, as a countryman once said.

CONCLUSION

I have been requested to draft a sketch of the prominent incidents in my business career and these pages are intended to be a record of the same.

In reading over the several chapters I realize that I have failed to satisfy my expectations in compiling articles as consecutively as I had hoped.

Another revision will doubtless prove equally unsatisfactory to the writer, so the articles have been printed as they were first written.

If, perchance, this pamphlet meets the eyes of any of those who have so faithfully performed their share of successful work while in my employ, they are here assured of my great appreciation of their services.

Should the perusal of these pages entertain anyone for a half hour and otherwise prove of interest, the writer will feel gratified.

In explanation of the apparent repetition of some parts of the history the table of contents is arranged to cover that point.

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